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The impact of fundamental information on EUR currency - evidence from the market

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Abstract

Investors, and especially daily traders, follow announcements of the fundamental information and transform them into the orders, what makes the Forex market one of the most sensitive market worldwide. In addition to "classical" economic information published by government institutions, there is also a set of fundamental information, announced by independent institutions, which over time gained the trust of traders and their announcements significantly affect the spot value of the currency. In the five years period we have observed the expected and the real value of fundamental information, generally termed as information with the High Impact. Research covers quantitative fundamental information announced by governmental departments as well as fundamental information announced by associations or research institutions with the influence on the EUR currency. Market reaction and change of value is monitored on the main currency pair EUR/USD. The paper discusses coverage area, periodicity and potential impact of the selected fundamental information and according to the observations, the tangible reaction of the traders and through the reaction, the real impact of these fundaments on the currency. At the end of the paper findings from the market and reliability of the each of the selected fundamental information is discussed.

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Keywords: Fundamental Information; Price; Forex; EUR/USD; Range

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1. Introduction

Currently there are several approaches that influence not only individual investors, but also investment companies and banks in the creation of investment portfolios. When we omit the technical and psychological analysis, the remaining generally used approach is based on fundamental information. However, the fundamental analysis approach provides several variations on the basis of whether the focus is on corporate, sector level or the overall economy. Of course the fundamental approach highly depends on the underlying assets which the traders are investing in. Some of the authors are focused on fundamental information based on the internal processes of companies (Gavurová, 2012; Šoltés – Gavurová, 2013). According to Bonenkamp et al. the trend merely reflects temporary pricing pressures, technical trading will presumably fail and using financial statements as an additional source of information helps to avoid such failure (Bonenkamp et al, 2011). Other authors are trying to analyze risk of stocks with comparison to the market risk (Glova, 2013b). Another variation of fundamental analysis is trying to look at the capital investments and using new technologies in the sectors (Gavurová et al., 2014). Individual investors could also follow indices and look for trading opportunities (Glova, 2013a). Since in the paper we will discuss the impact of the fundamental information on the currency, probably we can adopt the expression from McClure, that, on a broader scope, we can perform fundamental analysis on industries or the economy as a whole (McClure, 2010). In the research we will focus especially on influential fundamental information that provides information about economy as a whole or are trying to predict the future behavior of involved economic entities. For this reason we will focus on the observation of fundamental information published by governmental or generally accepted research institutions.

2. Methodology

For the research we chose a set of fundamental information with potentially high impact on EUR currency and the testing of impact was performed on the values of the currency pair EUR/USD. The primary selection of fundamental information was made according to the evaluation by Forexfactory.com. After the analysis, we selected 6 fundaments with high impact on the EUR currency, namely: French Flash Manufacturing PMI, German Flash Manufacturing PMI, German Ifo Business Climate, German ZEW Economic Sentiment, CPI Flash Estimate y/y, Minimum Bid Rate. Table 1 compares importance of potential impact of selected fundamental information according to several most popular online resources for Forex traders.

Table 1. Estimate impact of fundamental information according to most popular online resources.

	Forexfactory.com	Bloomberg(Econoday.com)	TradingEconomics.com	FxStreet.com
French Flash Manufacturing PMI	***	**	*	*
German Flash Manufacturing PMI	***	**	**	**
German Ifo Business Climate	***	**	***	**
German ZEW Economic Sentiment	***	**	***	**
CPI Flash Estimate Y/Y	***	**	***	***
Minimum Bid Rate	***	**	***	***

Mark	Forexfactory.com	Bloomberg/Econoday.com	TradingEconomics.com	FxStreet.com
*	Low impact	Other Key Indicators	Low Importance	Low Volatility Expected
**	Medium impact	Merit Extra Attention	Medium Importance	Moderate Volatility Expected
***	High impact	Market Movers	Strong Importance	High Volatility Expected

Data of the French Flash Manufacturing PMI indicator was also included in the sample, despite the fact that TradingEconomics.com and FXStreet.com marked this fundamental information as indicator with Low Importance respectively with Low Volatility Expectation. For other indicators, there was more or less consensus in determining of their importance. For impact testing we have chosen the period from January 2007 to December 2013, which represents around 84 observations for each studied indicator. Fundamental information announcements were timed to CET like the time series of the price movement of the currency pair EUR/USD. Research data were obtained from the records of Bloomberg.

The basic idea of research and testing was the idea that about five minutes before an announcement of the fundamental information appeared on the market, orders based on the forecasted values of the indicator where assumed to force change in value of the currency pair.

We watched % price change at 5 minutes (5M) intervals before the announcement of selected fundamental information and % price change at 5M intervals without announcement. By comparison between these two groups, we tested the statistical significance of the impact of fundamental information to the price change. Price change was defined as:

$$Pd_T = \frac{Close_T - Open_T}{Open_T} \times 100 \quad (1)$$

Where:
PdT - price difference in selected timeframe,
CloseT - close price in selected timeframe,
OpenT - open price in selected timeframe.

Additional indicator that was examined within research was Range, normalized to the close price expressed as a percentage:

$$R_T = \frac{High_T - Low_T}{Close_T} \times 100 \quad (2)$$

Subsequently, price shift occurs, according to the difference between forecasted and actual value of the fundamental information, which we monitored during period 1 hour (1H) after announcement. The hour interval was chosen due to the possible revisions of the announcement values of the selected fundamental information that may appear on the market and may additionally affect the currency pair. We assumed that there is a difference in price movement at 1H timeframe after announcement of high impacted fundamental information in comparison with common price movement without announcements.

In testing we assumed a normal distribution and we performed the t-test for two samples with unequal variances – Welch t-test. (Welch, 1938) We also examined whether the difference between the forecast value and the actual value at the announcement time was positive or negative, and what influence this difference had on the price change.

2.1. The results of testing for 5 minutes timeframe

In Table 2 we can see the mean of the price change of EUR/USD at 5M timeframe, in the case that there was no announcement of the fundamental information, together with the mean of the price change at the timeframe 5M before announcement of fundamental information. The fundaments were tested all together as well as individually. According to p-value we can say that there is no statistically significant difference between change in the value of EUR/USD at the time 5M before announcement of the fundamental information and value change at 5M timeframes without fundamental information announcement.

Table 2. Price difference at 5M timeframe (%)

	Mean without announcement	Mean 5min before announcement	pValue
All fundaments together	-0.000018%	-0.000627%	0.7729
F1 - French Flash Manufacturing PMI	-0.000019%	-0.001355%	0.8170
F2 - German Flash Manufacturing PMI	-0.000019%	-0.003603%	0.6397
F3 - German Ifo Business Climate	-0.000020%	0.004005%	0.3505
F4 - German ZEW Economic Sentiment	-0.000019%	-0.002761%	0.5889
F5 - CPI Flash Estimate Y/Y	-0.000019%	0.001387%	0.7775
F6 - Minimum Bid Rate	-0.000019%	-0.002053%	0.5555

The different situation occurred when we have tested range. Table 3 shows results of testing range, i.e. difference between high and low, normalized to a close value. According to a p-value, there is a statistically significant difference between mean in the sample of data with no announcement and mean in the sample of data at 5 min. before announcement of fundamental information. No statistically significant difference was observed only in the Minimum Bit Rate. That situation can be expected, as the Bid Rate often remains unchanged.

Table 3. Range 5M timeframe

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.049220%	0.063092%	2.017e-13
F1 - French Flash Manufacturing PMI	0.049230%	0.064452%	0.01048
F2 - German Flash Manufacturing PMI	0.049228%	0.079506%	3.28e-06
F3 - German Ifo Business Climate	0.049230%	0.061102%	0.002192
F4 - German ZEW Economic Sentiment	0.049230%	0.061993%	0.0007962
F5 - CPI Flash Estimate Y/Y	0.049230%	0.062257%	0.002377
F6 - Minimum Bid Rate	0.049232%	0.052205%	0.3928

2.2. The results of testing for 1 hour timeframe

In testing at 1H timeframe, as was already mentioned, we assumed that the fundamental information affects currency and therefore there is a price movement of the currency pair EUR/USD. This testing we divided into two phases. In the first phase, we tested impact of fundaments without taking into account whether the current

value of the fundamental information is different than the forecast. Table 4 show results of Price testing. Like in testing at 5M timeframe according to p-value we can claim that there is no statistically significant difference between the change in value of EUR/USD at the time of 1H after the announcement of fundamental information and change of the value at the 1H timeframes without fundamental information announcements.

Table 4. Price difference at 1H timeframe (%)

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.000161%	-0.012860%	0.1344
F1 - French Flash Manufacturing PMI	0.000153%	-0.028106%	0.1604
F2 - German Flash Manufacturing PMI	0.000155%	-0.044209%	0.06301
F3 - German Ifo Business Climate	0.000148%	0.004823%	0.8469
F4 - German ZEW Economic Sentiment	0.000148%	0.007409%	0.6851
F5 - CPI Flash Estimate Y/Y	0.000147%	0.012808%	0.3556
F6 - Minimum Bid Rate	0.000155%	-0.037651%	0.1464

After Range testing at 1H timeframe we achieved similar results like at 5M timeframe. According to p-value, in testing Range, we can claim that there is statistically significant difference between means in the sample with and without announcement of fundamental information. Significant difference was observed in the sample with all fundaments together as well as in testing of fundaments individually. The only fundament, which was marked as not statistically significant was F5 - CPI Flash Estimate (Y/Y).

Table 5. Range difference at 1H timeframe

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.184919%	0.276502%	2.2e-16
F1 - French Flash Manufacturing PMI	0.184991%	0.265812%	3.826e-06
F2 - German Flash Manufacturing PMI	0.184987%	0.301670%	6.266e-11
F3 - German Ifo Business Climate	0.184984%	0.301009%	1.882e-05
F4 - German ZEW Economic Sentiment	0.184987%	0.278149%	4.564e-08
F5 - CPI Flash Estimate Y/Y	0.184999%	0.203790%	0.08132
F6 - Minimum Bid Rate	0.184982%	0.310993%	4.768e-06

In second phase of testing we have focused on information if the difference between forecast and actual value of fundamental information was positive or negative. The following Figure shows the distribution of deviations the actual value of announced fundamental information from the forecasted value.

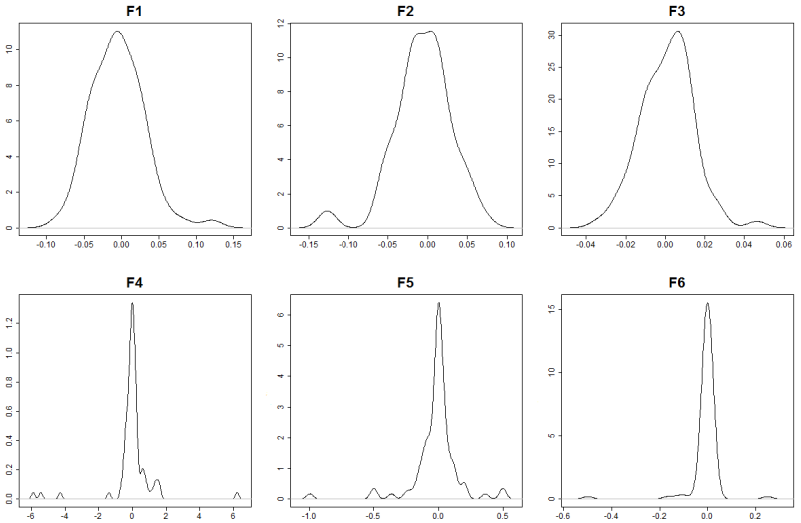

Fig. 1. Distribution of deviations between forecast and actual value of fundaments in % (F1) French Flash Manufacturing PMI; (F2) German Flash Manufacturing PMI; (F3) German Ifo Business Climate; (F4) German ZEW Economic Sentiment; (F5) CPI Flash Estimate y/y; (F6) Minimum Bid Rate

The x-axis shows the deviation of the actual value from the forecasted value of the fundament provided in % and the y-axis shows the frequency of deviations. As we can see on the charts the distributions of the first three fundaments are relatively consistent, in contrast to the German Economic sentiment, CPI Flash Estimate, which show higher level of kurtosis and also these fundaments were characterized by increased incidence of extreme values.

The differences between forecast and actual values were used for additional testing, where also impact of the positive or negative difference was examined. The following tables show the results of each testing of the Price and Range difference, 1 hour after announcement, depending on whether the current value of announcing information was positive or negative.

Table 6. Price difference at 1H timeframe - after announcement (actual value higher than expected)

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.000161%	0.026069%	0.08437
F1 - French Flash Manufacturing PMI	0.000161%	0.026069%	0.9373
F2 - German Flash Manufacturing PMI	0.000153%	-0.002015%	0.2606
F3 - German Ifo Business Climate	0.000155%	0.041249%	0.1526
F4 - German ZEW Economic Sentiment	0.000148%	0.042749%	0.8356
F5 - CPI Flash Estimate y/y	0.000148%	-0.008232%	0.1397
F6 - Minimum Bid Rate	N/A	N/A	N/A

The Table 6 shows testing of Price difference one hour after announcement and actual value of the fundament was higher than forecasted value. As we can see, similar to the earlier testing, there is no statistically significant difference between mean in the sample of Price difference one hour after announcement and difference in the case there is no announcement of fundamental information.

Interesting situation occurred when we have testing Price difference one hour after announcement and the actual value was lower than forecasted value of fundamental information. As we can see in the Table 7 there is significant difference between means in the sample with and without announcement for all fundaments together, although most of the fundaments were statistically insignificant. Result was influenced mainly by the fundament F2 – German Flash Manufacturing PMI. If the actual value of fundament F2 was lower than forecasted, the traders reacted to that information more sensitive than to the other fundaments and the Price difference was higher.

Table 7. Price difference at 1H timeframe - after announcement (actual value lower than expected)

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.000161%	-0.066039%	0.001925
F1 - French Flash Manufacturing PMI	0.000153%	-0.042638%	0.1826
F2 - German Flash Manufacturing PMI	0.000155%	-0.125830%	0.0004248
F3 - German Ifo Business Climate	0.000148%	-0.029258%	0.59
F4 - German ZEW Economic Sentiment	0.000148%	-0.047959%	0.6314
F5 - CPI Flash Estimate y/y	0.000147%	-0.014346%	0.6541
F6 - Minimum Bid Rate	0.000155%	-0.355674%	0.3297

After testing Range at the 1H timeframe, we found more statistically significant differences. The Table 8 shows Range difference, when actual value of announced information was higher than forecasted, and we can see that difference between means of two samples was statistically significant in testing all fundaments together. The result was affected mainly by French and German Flash Manufacturing PMI and German Ifo Business Climate. In all mentioned fundaments, the difference between means of the Range with and without announcements was statistically significant.

Table 8. Range difference at 1H timeframe - after announcement (actual value higher than expected)

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.184919%	0.265582%	5.303e-14
F1 - French Flash Manufacturing PMI	0.184991%	0.256917%	0.0001437
F2 - German Flash Manufacturing PMI	0.184987%	0.297022%	1.668e-06
F3 - German Ifo Business Climate	0.184984%	0.285854%	1.209e-05
F4 - German ZEW Economic Sentiment	0.184987%	0.211211%	0.3585
F5 - CPI Flash Estimate y/y	0.184999%	0.208729%	0.1012
F6 - Minimum Bid Rate	N/A	N/A	N/A

The same situation indicates also Table 9 where, in the testing, the actual value of announced fundamental information was lower than forecasted value. In this case, the same set of fundamental information was statistically significant.

Table 9. Range difference at 1H timeframe - after announcement (actual value lower than expected)

	Mean without announcement	Mean with announcement	pValue
All fundaments together	0.184919%	0.304190%	1.946e-07
F1 - French Flash Manufacturing PMI	0.184991%	0.269655%	0.009745
F2 - German Flash Manufacturing PMI	0.184987%	0.320363%	1.621e-05
F3 - German Ifo Business Climate	0.184984%	0.358209%	0.01221
F4 - German ZEW Economic Sentiment	0.184987%	0.254141%	0.2916
F5 - CPI Flash Estimate y/y	0.184999%	0.211825%	0.2332
F6 - Minimum Bid Rate	0.184982%	0.635572%	0.2279

3. Conclusion

In the research we studied values of selected fundaments, Price and Range differences at 5M and 1H timeframes. In testing Price differences we did not observe statistically significant difference as at the 5M timeframe as well as at 1H timeframe. The only exception in testing was situation at the 1H timeframe, one hour after announcement of German Flash Manufacturing PMI, where the actual value was lower than the forecasted value. When testing Range, the results were diametrically different. At 5M timeframe before announcement we observed statistically significant increase of range from 24.12% for German Ifo Business Climate to 61.50% for German Flash Manufacturing PMI. The highest average Range interval increase (93.64%) was observed at 1H timeframe, when actual value was lower than forecast for the fundament German Ifo Business Climate. This research will provide the basis for subsequent monitoring of price movements and changes on the time series as well as determining the trend and testing whether observed fundaments affect the changes in trend for the time series.

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